

ADVANCED SUBSIDIARY GCE
HUMAN BIOLOGY

2856

Blood, Circulation and Gaseous Exchange

WEDNESDAY 9 JANUARY 2008

Morning
 Time: 1 hour

Candidates answer on the question paper.
Additional materials: Electronic calculator
 Ruler (cm/mm)



Candidate Forename

Candidate Surname

Centre Number

Candidate Number

INSTRUCTIONS TO CANDIDATES

- Write your name in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use blue or black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure that you know what you have to do before starting your answer.
- Answer **all** the questions.
- Do **not** write in the bar codes.
- Do **not** write outside the box bordering each page.
- Write your answer to each question in the space provided.

INFORMATION FOR CANDIDATES

- The number of marks for each question is given in brackets [] at the end of each question or part question.
- The total number of marks for this paper is **60**.
- You will be awarded marks for the quality of written communication where this is indicated in the question.
- You may use an electronic calculator.
- You are advised to show all the steps in any calculations.

FOR EXAMINER'S USE		
Qu.	Max.	Mark
1	10	
2	8	
3	12	
4	9	
5	11	
6	10	
TOTAL	60	

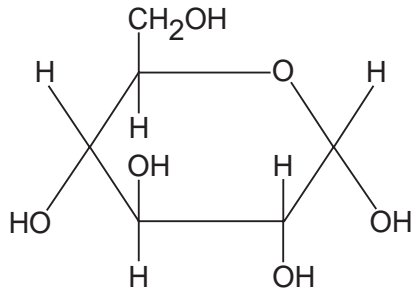
This document consists of **14** printed pages and **2** blank pages.

Answer **all** the questions.

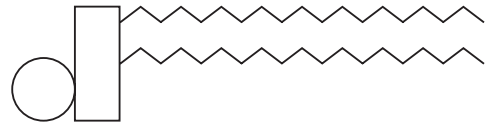
1 The human body is made up of many different molecules.

Fig. 1.1 shows the structures of some of these molecules.

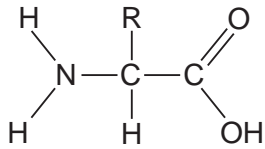
A



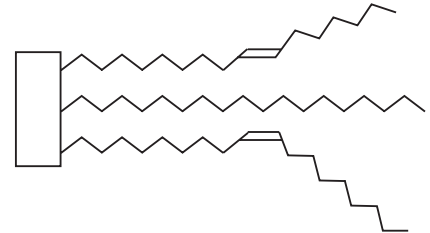
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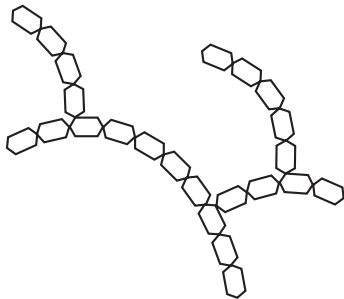
C



D



E



F

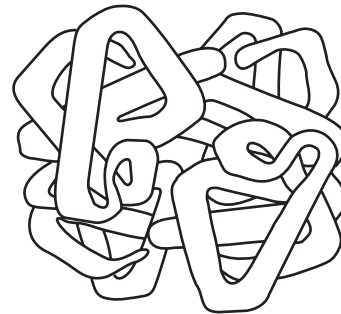


Fig. 1.1

(a) (i) Using letters **A** to **F**, state which molecule in Fig. 1.1 represents:

glycogen

a triglyceride [2]

(ii) Using letters **A** to **F**, state a molecule in Fig. 1.1 that contains:

peptide bonds

ionic bonds

ester bonds [3]

(b) Glycogen is an energy storage molecule.

(i) Name **two** organs that store glycogen.

1

2 [2]

(ii) Describe how the **structure** of glycogen is related to its role as an energy storage molecule.

.....

.....

.....

.....

.....

..... [3]

[Total: 10]

2 If a blood vessel is damaged, clot formation rapidly prevents blood loss.

Fig. 2.1 shows some of the events that take place during blood clotting.

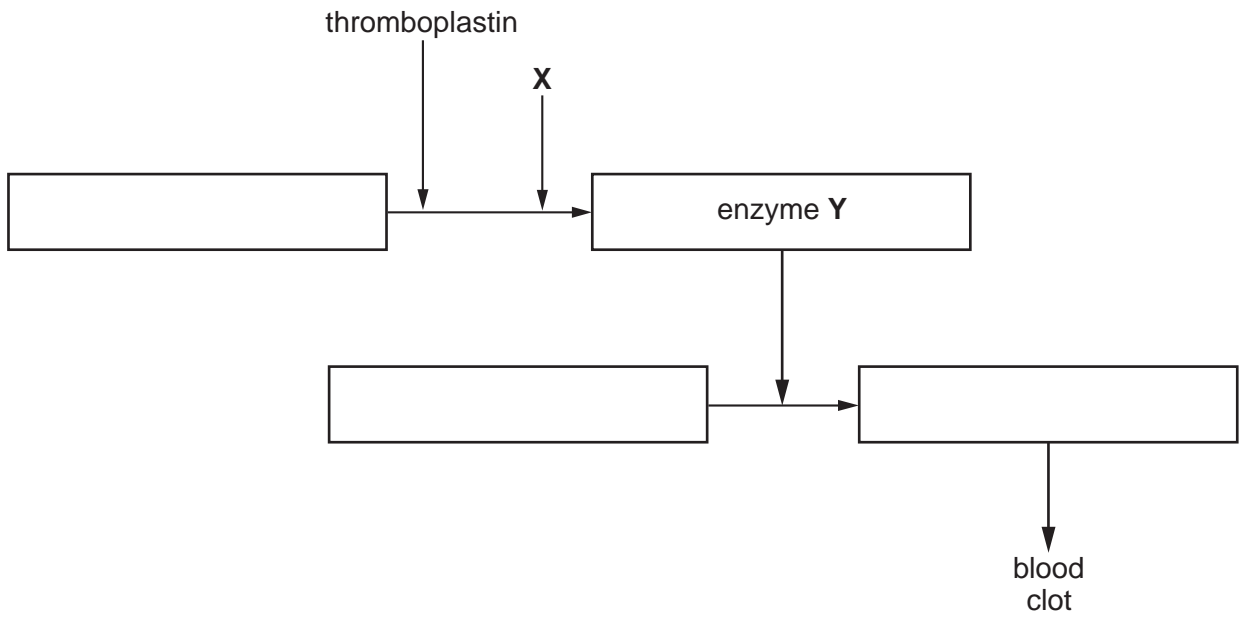


Fig. 2.1

(a) (i) Complete the diagram by filling in the boxes. [3]

(ii) Name the ions labelled X.

..... [1]

(b) Fig. 2.2 shows the structure of enzyme Y, its normal substrate and another molecule, Z.

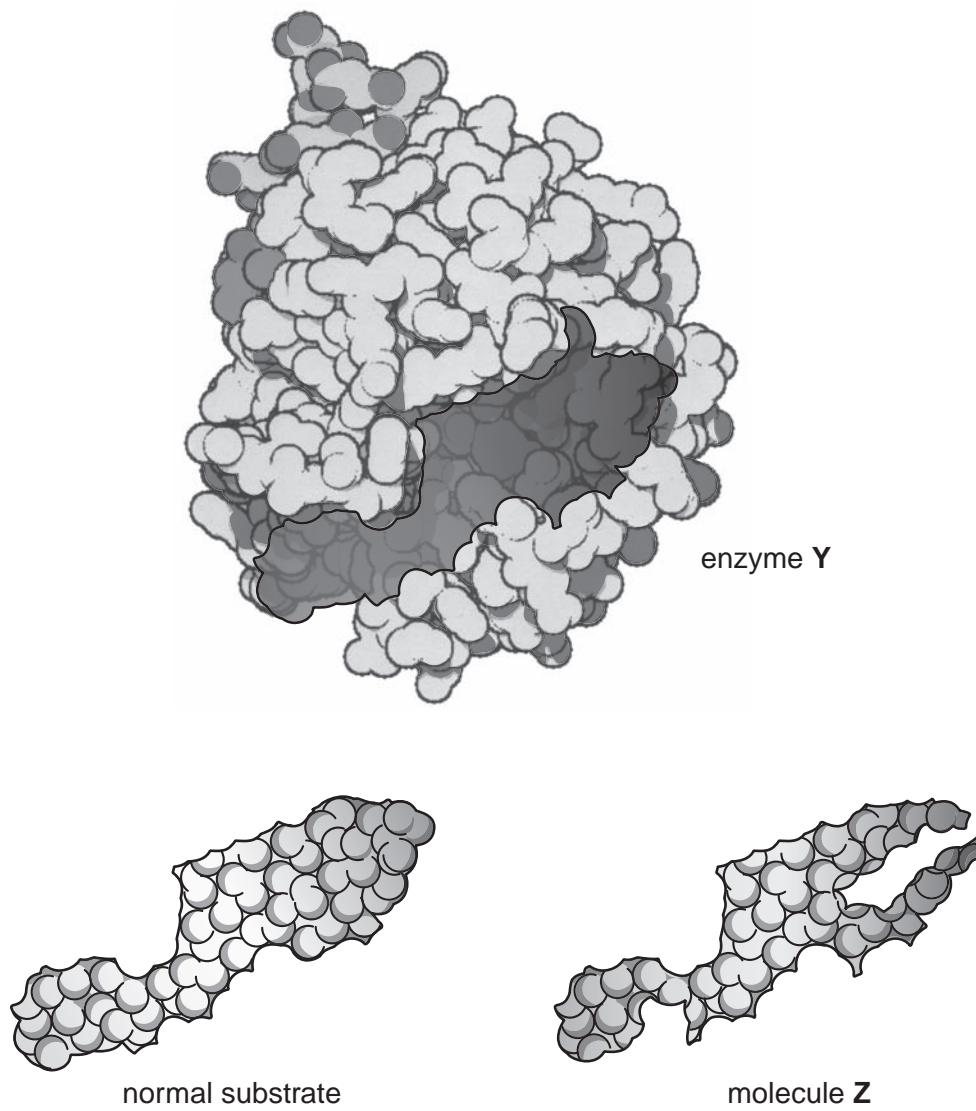


Fig. 2.2

Describe how molecule Z may affect the function of enzyme Y.

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.....

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.....

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.....

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..... [4]

[Total: 8]

[Turn over

- (b) Following a myocardial infarction, a coronary bypass is often performed to improve the health of a patient with severe CHD.

Outline the main features of a coronary bypass procedure.

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..... [3]

[Total: 12]

4 Fig. 4.1 shows two types of cells found in and around alveoli.

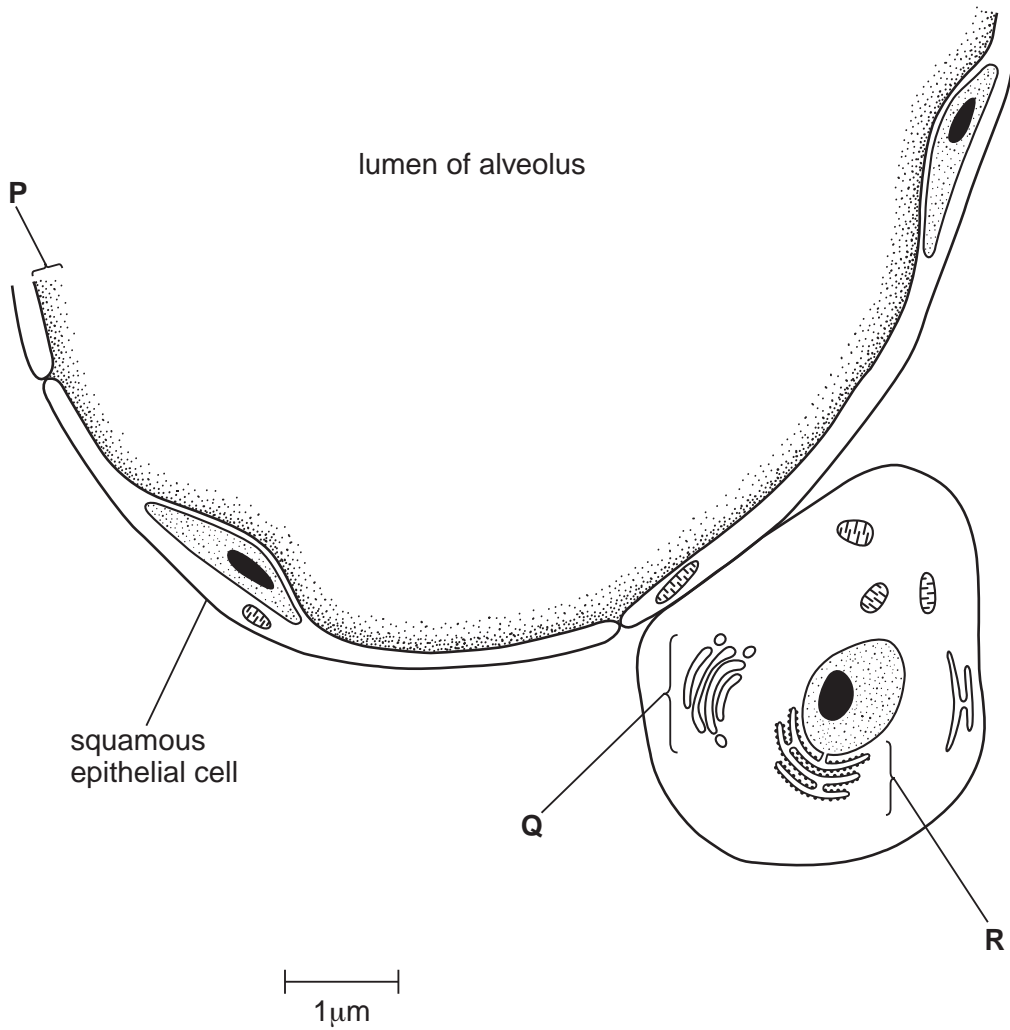


Fig. 4.1

(a) (i) Name P, Q and R.

P

Q

R [3]

(ii) Using the scale bar shown in Fig. 4.1, calculate the magnification of the diagram.

Show your working.

Answer = [2]

(b) Explain how the squamous epithelial cells shown in Fig. 4.1 are adapted for gaseous exchange.

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.....
.....
.....
..... [2]

(c) State why the cells shown in Fig. 4.1 could **not** be plant cells.

.....
..... [2]

[Total: 9]

5 The prevalence of chronic lung disease in the UK has increased considerably in the last 10 years and is now greater than the European Union average.

'Lung disease' covers a wide range of different diseases.

(a) Name **two** lung diseases that are linked to cigarette smoking.

- 1
- 2 [2]

(b) Name a lung disease which can be triggered by the body responding to allergens.

..... [1]

(c) Describe the main symptoms of tuberculosis (TB).

.....
.....
.....
.....
.....
.....
.....
.....
..... [3]

(d) One way to assess the health of a person's respiratory system is to measure lung function.

Table 5.1 shows some information about lung function measurements.

Table 5.1

measurement	description
tidal volume	the volume of air inhaled or exhaled during a single breath
	the volume of air exhaled in the first second of a forced expiration
Peak Expiratory Flow Rate (PEFR)	
vital capacity	

(i) Complete Table 5.1 by filling in the missing information. The first row has been done for you.

[3]

(ii) In cases of TB, the tidal volume decreases.

Explain why this happens.

.....

.....

.....

.....

..... [2]

[Total: 11]

(c) Red blood cells take up oxygen and glucose for respiration from plasma.

Fig. 6.1 shows how the uptake of:

- oxygen varies with the concentration of oxygen in the surrounding fluid
- glucose varies with the concentration of glucose in the surrounding fluid.

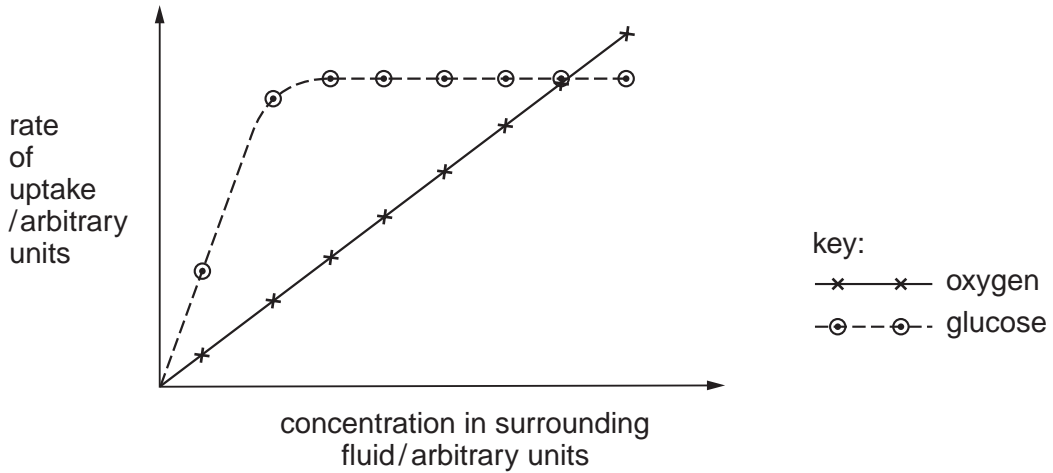


Fig. 6.1

(i) Explain why the rate of uptake of oxygen increases as the concentration of oxygen in the surrounding fluid increases.

.....
.....
..... [2]

(ii) Glucose is transported across the cell surface membrane by facilitated diffusion.

Explain the shape of the curve for glucose.

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.....
..... [2]

[Total: 10]

END OF QUESTION PAPER

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